

Claims

1. A protecting apparatus for protecting a structure from an impact, said
5 protecting apparatus being arranged to be mounted on the structure and
including a bumper member, a structure positioning member and at least one
resiliently flexible joining portion, said structure positioning member being
arranged in use to be positioned in contact with or adjacent to a portion of the
structure being protected, said at least one resiliently flexible joining portion
10 extending between said bumper member and said structure positioning member
so that when an outer surface of the bumper member is impacted the impact
force is dissipated at least in part by flexure of said at least one joining portion.
2. A protecting apparatus according to claim 1 wherein the impact force is
15 further dissipated by flexure of said bumper member and/or said structure
positioning member.
3. A protecting apparatus according to claim 1 or claim 2 wherein said at
least one resiliently flexible joining portion adopts a tortuous path between the
20 bumper member and the structure positioning member.
4. A protecting apparatus according to claim 3 wherein the tortuous path is
curved so as to minimise any points of stress concentration along said path.
- 25 5. A protecting apparatus according to any one of the preceding claims
wherein a first end of said joining portion is connected to the bumper member
and a second end is connected to the structure positioning member.
6. A protecting apparatus according to claim 5 wherein connection of said
30 first and second ends of said joining portion to the respective bumper member
and structure positioning member occurs at a zone of connection so as to
minimise stress concentrations in the protecting apparatus.

7. A protecting apparatus according to claim 6 wherein stress concentrations are minimised by curving the zones of connection.

8. A protecting apparatus according to any one of the preceding wherein
5 the bumper member has a first end and a second end, said first and second ends being arranged to be joined to the structure positioning member by respective first and second resiliently flexible joining members.

9. A protecting apparatus according to claim 8 wherein said first and
10 second joining members, said bumper member and said structure positioning member are shaped so as to define an opening in which the portion of the structure can be received.

10. A protecting apparatus according to claim 9 wherein a tongue is located
15 at or adjacent to each of the first and second ends of the bumper member, said tongue being arranged in use to contact the structure when it is located in the opening and to facilitate retention of the protecting apparatus about said structure.

20 11. A protecting apparatus according to claim 10 wherein a further tongue may be provided on each of the first and second joining members to further facilitate retention of the protecting apparatus about said structure.

12. A protecting apparatus according to any one of claims 10 or 11 wherein
25 the tongues are resiliently flexible and arranged so that they are deflected in order to receive the portion of the structure within the opening and, once the portion of the structure is located in the opening, arranged to engage against the structure.

30 13. A protecting apparatus according to any one of the preceding claims further including a securing member arranged to retain the protecting apparatus about said structure.

14. A protecting apparatus according to any one of the preceding claims which is arranged to be retained tightly on the structure or to be retained in a manner which allows it to be slid along a length thereof.

5 15. A protecting apparatus according to any one of the preceding claims wherein the bumper member is configured so as to extend about a major portion of the structure so as to protect as much of the structure as possible.

10 16. A protecting apparatus according to any one of the preceding claims wherein the surface of the bumper member is smooth and continuous.

17. A protecting apparatus according to any one of the preceding claims wherein the bumper member, structure positioning member and said at least one joining portion are integrally formed.

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18. A protecting apparatus according to claim 17 wherein the protecting apparatus is moulded as a single piece in a plastics material.

20 19. A protecting apparatus according to any one of the preceding claims arranged so that a plurality of such protecting apparatus can be stacked one on top of the other along a length of the structure.